

DETECTION OF FOREST INSECT ACTIVITY ON THE  
SHENANDOAH NATIONAL PARK

BY

CHARLES W. DULL

INTRODUCTION

ON JUNE 15-19, CHARLES DULL, FOREST INSECT AND DISEASE MANAGEMENT, DORAVILLE, GEORGIA MET WITH WOODBURY PHILLIPS, WILDLIFE BIOLOGIST, SHENANDOAH NATIONAL PARK TO CONDUCT A SURVEY OF FOREST INSECT ACTIVITY ON THE PARK. THE DETECTION SURVEY WAS CONDUCTED IN FOUR PHASES:

1. AERIAL DETECTION SURVEY.
2. ON-SITE EXAMINATIONS OF DAMAGE OBSERVED DURING THE AERIAL SURVEY.
3. GYPSY MOTH DETECTION SURVEY.
4. PARASITE EVALUATION.

METHODS

1. AN AERIAL SURVEY WAS CONDUCTED JUNE 19, TO DETECT THE PRESENCE OF FOREST INSECT AND DISEASE ACTIVITY WITHIN THE PARK. APPROXIMATELY 225,000 ACRES WERE SURVEYED AT 80% COVERAGE. STANDARD SKETCHMAP PROCEDURES WERE EMPLOYED.

2. GROUND CHECKS WERE MADE OF AREAS DETECTED DURING THE AERIAL SURVEY TO DETERMINE THE CAUSE OF THE TREE DAMAGE.

3. A GYPSY MOTH, *Lymantria dispar* (L.), SURVEY WAS DIRECTED PRIMARILY AT DETECTING LOW DENSITY POPULATIONS AT CAMPSITES AND RECREATION AREAS. THE AERIAL SURVEY WAS PLANNED TO COINCIDE WITH THE PERIOD OF MAXIMUM DEFOLIATION ACTIVITY BY GYPSY MOTH.

IN APRIL 1978, FIDM PERSONNEL SET OUT 40 BURLAP BAND TRAPS (FIG. 1) AT THE FOLLOWING LOCATIONS:

- (1) DICKEY RIDGE VISITOR CENTER
- (2) MATHEWS ARM CAMPGROUND
- (3) BIG MEADOWS CAMPGROUND
- (4) LOFT MOUNTAIN CAMPGROUND.

THESE LOCATIONS WERE CONSIDERED POTENTIAL INFESTATION AREAS SINCE THE MOVEMENT OF RECREATIONAL VEHICLES INTO THESE HIGH USE AREAS COULD EASILY RESULT IN THE ACCIDENTAL TRANSPORTING OF VIABLE GYPSY MOTH LIFE FORMS AS "HITCH-HIKERS."

THE WORK PLAN CALLED FOR PLACEMENT OF THE BANDS AT HEIGHTS ON THE TREES, CA. EIGHT FEET ABOVE THE GROUND, WHERE THEY WOULD NOT BE DISTURBED BY THE PUBLIC.

THE BURLAP BANDS WERE MONITORED DURING THE WEEKS OF JUNE 12-16 AND JULY 17-21, 1978. ALL BANDS WERE REMOVED FOLLOWING THE SECOND EXAMINATION.

4. ALL LARVAE AND PUPAE FOUND UNDER THE BURLAP BANDS WERE COLLECTED TO IDENTIFY THE PARASITES ATTACKING NATIVE FOREST INSECT POPULATIONS AS WELL AS THE INTRODUCED GYPSY MOTH, IF PRESENT. SPECIMENS WILL BE HELD IN FEEDING CONTAINERS UNTIL EMERGING AS ADULTS OR PARASITE EMERGENCE. ONE OBJECTIVE OF THIS SURVEY WAS TO DETERMINE IF NATIVE FOREST INSECTS WITHIN THE PARK ARE ALTERNATE HOSTS TO INTRODUCED GYPSY MOTH PARASITES.

## RESULTS

1. AERIAL SURVEY - SMALL SCATTERED AREAS OF LIGHT TO MODERATE DEFOLIATION WERE OBSERVED THROUGHOUT THE PARK. AN ESTIMATED 5,400 ACRES (2,150 HA.) WERE DEFOLIATED. AN AREA OF SCATTERED RED-TOPPED PINES WAS OBSERVED NEAR SPITLER HILL, PROBABLY CAUSED BY LIGHTNING STRIKES (SEE ATTACHED MAPS).

2. ON-SITE EXAMINATIONS OF THE DEFOLIATED AREAS REVEALED A DEFOLIATOR COMPLEX CONSISTING OF ENDEMIC POPULATIONS OF THE FALL CANKERWORM, *Alsophila pometaria* (HARR), THE FOREST TENT CATERPILLAR, *Malacosoma disstria* HUBNER, AND THE EASTERN TENT CATERPILLAR, *M. americanum* (F.). LARGE NUMBERS OF THE FOREST TENT CATERPILLAR APPEARED TO BE DYING DUE TO A VIRAL DISEASE. NATURAL FACTORS SUCH AS PREDATORS AND PARASITES APPEARED NUMEROUS ENOUGH TO EFFECTIVELY CONTROL THE FOREST TENT CATERPILLAR.

STANDS OF BLACK LOCUST WERE BEING DEFOLIATED BY THE LOCUST LEAF MINER, *Xenochalepus dorsalis* (THUNBERG).

3. GYPSY MOTH SURVEY - NO LIFE STAGES OF *L. dispar* WERE DETECTED. GROUND CHECKS OF DEFOLIATED AREAS DID NOT REVEAL GYPSY MOTH POPULATIONS.

4. PARASITE EVALUATION - MANY SPECIES OF LARVAE AND PUPAE WERE COLLECTED FROM BENEATH THE BURLAP BANDS AND HELD FOR PARASITE EMERGENCE. THE MOST NUMEROUS WERE THE FOREST TENT CATERPILLAR, EASTERN TENT CATERPILLAR, WHITE-MARKED TUSSOCK MOTH, *Hemerocampa leucostigma* (I.E. SMITH), AND VARIOUS NOCTUID MOTHS.

INITIAL RESULTS INDICATE APPROXIMATELY 50% OF THE FOREST TENT CATERPILLAR LARVAE COLLECTED WERE PARASITIZED BY A VARIETY OF PARASITES. MANY OF THE PARASITES REMAIN TO BE IDENTIFIED.

THIS EVALUATION WILL NOT BE COMPLETED UNTIL NEXT SPRING, DUE TO THE DELAYED EMERGENCE OF SEVERAL OF THE PARASITIC SPECIES.

#### DISCUSSION AND CONCLUSIONS

FOREST INSECT ACTIVITY IS AT A LOW LEVEL AT THE PRESENT TIME. NATURAL PARASITES, PREDATORS AND DISEASE ARE EFFECTIVELY CONTROLLING THE FALL CANKERWORM AND FOREST TENT CATERPILLAR POPULATIONS PRESENT WITHIN THE PARK. SOUTHERN PINE BEETLE ACTIVITY WAS NOT DETECTED.

THE VIRGINIA DIVISION OF FORESTRY REPORTED THAT ALL LIFE STAGES OF THE GYPSY MOTH HAVE BEEN FOUND ALONG THE APPALACHIAN TRAIL IN LOUDOUN COUNTY, VIRGINIA. PARASITES HAVE BEEN RELEASED IN THE INFESTED AREA AND A SPRAY PROJECT TO ERADICATE THE INFESTATION WILL BE CONDUCTED BY THE DEPARTMENT OF AGRICULTURE IN VIRGINIA AND WEST VIRGINIA IN COOPERATION WITH THE USDA, APHIS. (FOR. PEST SURVEY REPT., VA. DIV. FOR., JULY-AUGUST, 1978).

IT IS INEVITABLE THAT THE GYPSY MOTH WILL INFEST HARDWOOD FORESTS SOUTH OF THE EXPANDING AREA OF THE GENERAL INFESTATIONS. THE EXACT MAGNITUDE OF THE IMPACT IS NOT KNOWN AT THIS TIME. THE SHENANDOAH NATIONAL PARK IS ONLY 30 MILES SOUTH OF WHAT IS NOW CONSIDERED THE ADVANCING FRONT OF GENERAL INFESTATION. IN GENERAL, THE FIRST THREE TO FIVE YEARS AFTER THE INTRODUCTION OF THE GYPSY MOTH INTO A NEW AREA THE INSECTS BECOME GENERALLY DISTRIBUTED AT LOW DENSITIES. AFTER ESTABLISHMENT, A POPULATION EXPLOSION MAY OCCUR THROUGHOUT THE AREA FOR TWO OR MORE YEARS IN SUCCESSION AFTER WHICH A POPULATION COLLAPSE USUALLY OCCURS. THEREFORE IT IS IMPORTANT TO DETERMINE WHEN THE GYPSY MOTH BECOMES ESTABLISHED IN AN AREA AND MONITOR THE STATUS OF THE POPULATION.

SURVEYS TO DETECT THE PRESENCE OF THE GYPSY MOTH SHOULD CONTINUE ON THE SHENANDOAH NATIONAL PARK. EGG MASS SURVEYS THIS WINTER AND EXPANDED LARVAL-PUPAL SURVEYS NEXT SPRING AND SUMMER SHOULD BE CONDUCTED TO DETERMINE IF AN INFESTATION EXISTS WITHIN THE NATIONAL PARK. THE LARGE EXPANSE OF SUSCEPTIBLE HARDWOOD HOSTS IN SUCH CLOSE PROXIMITY TO AN ACTIVE INFESTATION COULD CONTAIN LOW DENSITY POPULATIONS OF THE GYPSY MOTH WHICH MIGHT OTHERWISE REMAIN UNDETECTED.

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FOR ANY ADDITIONAL INFORMATION, CONTACT

FOREST INSECT AND DISEASE MANAGEMENT UNIT  
USFS - SOUTHEASTERN AREA

NORTHGATE OFFICE PARK, ROOM 2103	OR P.O. BOX 5895
3620 INTERSTATE 85, N.E.	ASHEVILLE, N.C. 28802
DORAVILLE, GA. 30340	TELEPHONE: 704-258-2850
TELEPHONE: 404-221-4796	EXT. 625



Fig. 1. Burlap bands encompassed large oaks in campgrounds to detect gypsy moth larvae and pupae.

# SHENANDOAH NATIONAL PARK

## RESULTS OF AERIAL DETECTION SURVEY June 19, 1978

Crew: C.W. Dull, FIDM  
Bud Phillips, Shenandoah  
National Park

Aircraft: Cessna 182

Area Surveyed: 225,000 acres

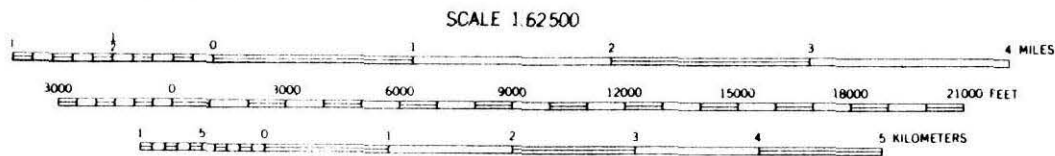


LIGHT TO MODERATE DEFOLIATION

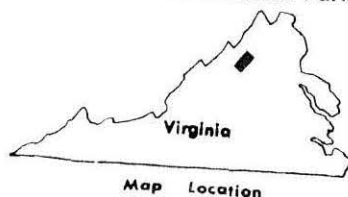
GYPSY MOTH TRAP SITE

### LEGEND

First Class Roads		Yellow Blazed Trails	
Second Class Roads		Not marked and maintained for public use. For experienced hikers only.	
Third Class Roads		Unmarked Trails	
Fourth Class Roads		Building — Church — School	
Park Service Roads (Not for public use)		Cabin — Shelter	
Appalachian Trail		Entrance Station — Ranger Station	
Park Service Trails		Stream and Falls — Spring	
Blue Blazed Trails		County Boundary	
		Park Boundary	



Contour Interval 100 Feet  
Shenandoah National Park



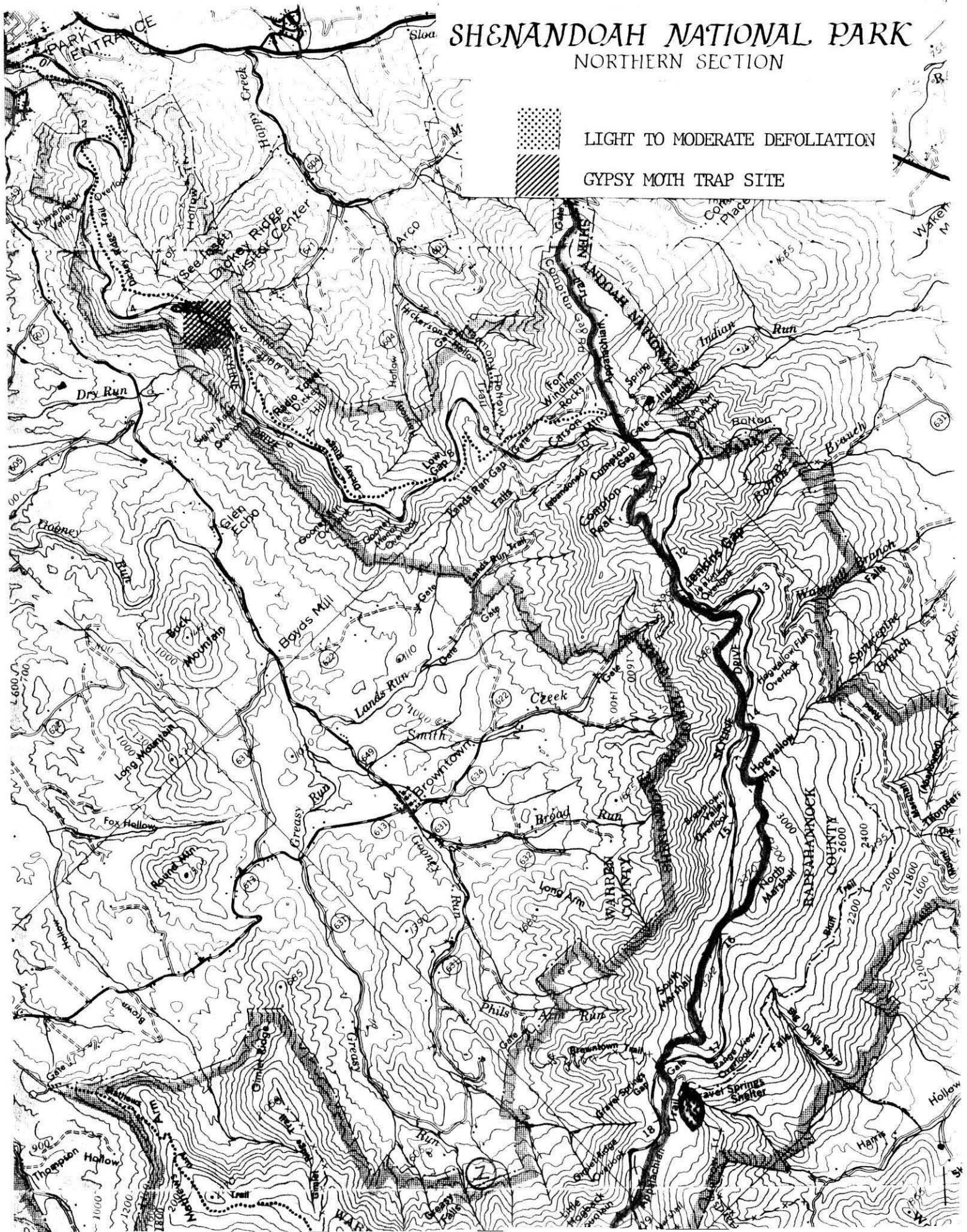


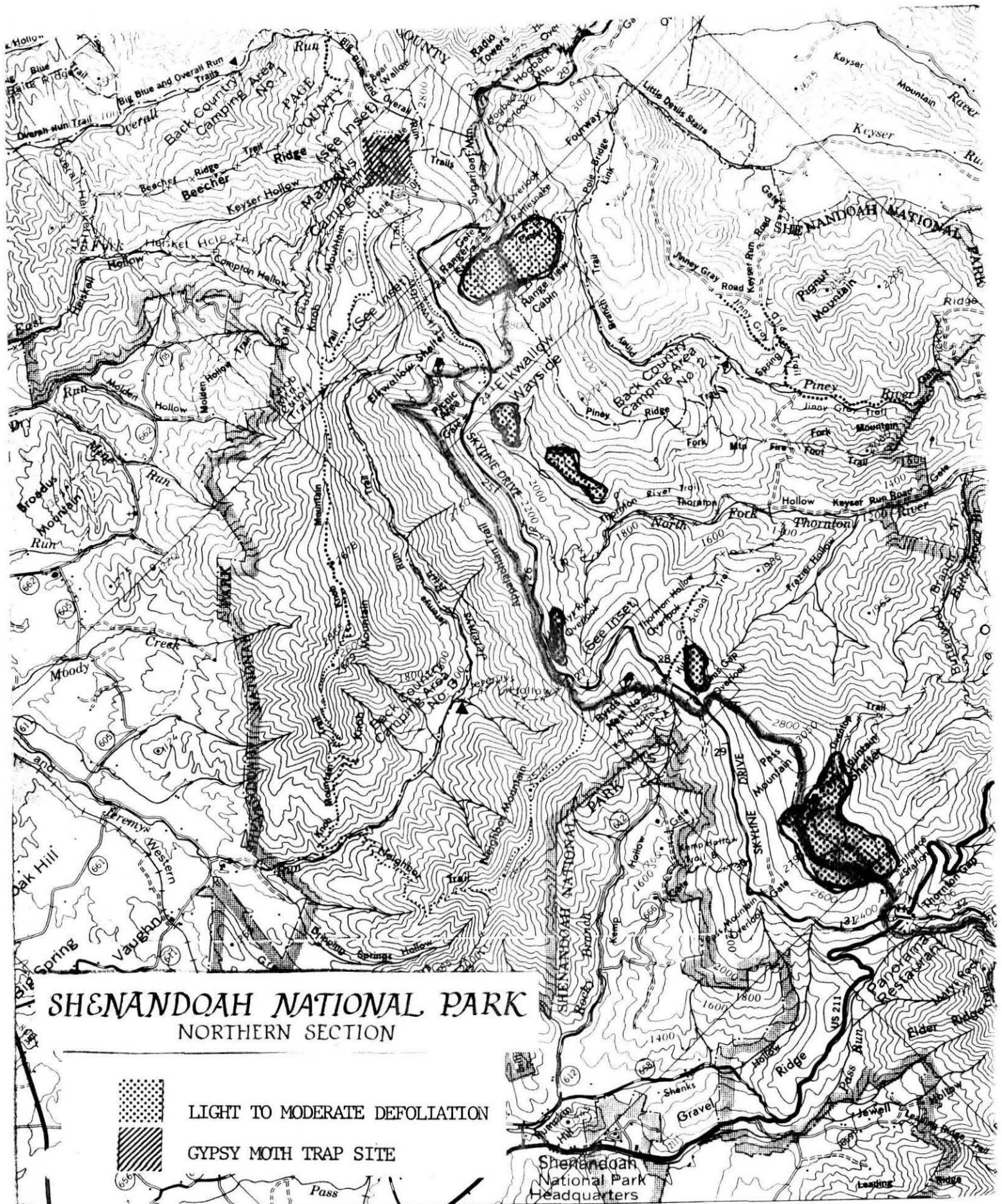
# SHENANDOAH NATIONAL PARK

## NORTHERN SECTION

LIGHT TO MODERATE DEFOLIATION

GYPSY MOTH TRAP SITE





# SHENANDOAH NATIONAL PARK

## NORTHERN SECTION



LIGHT TO MODERATE DEFOLIATION

GYPSY MOTH TRAP SITE

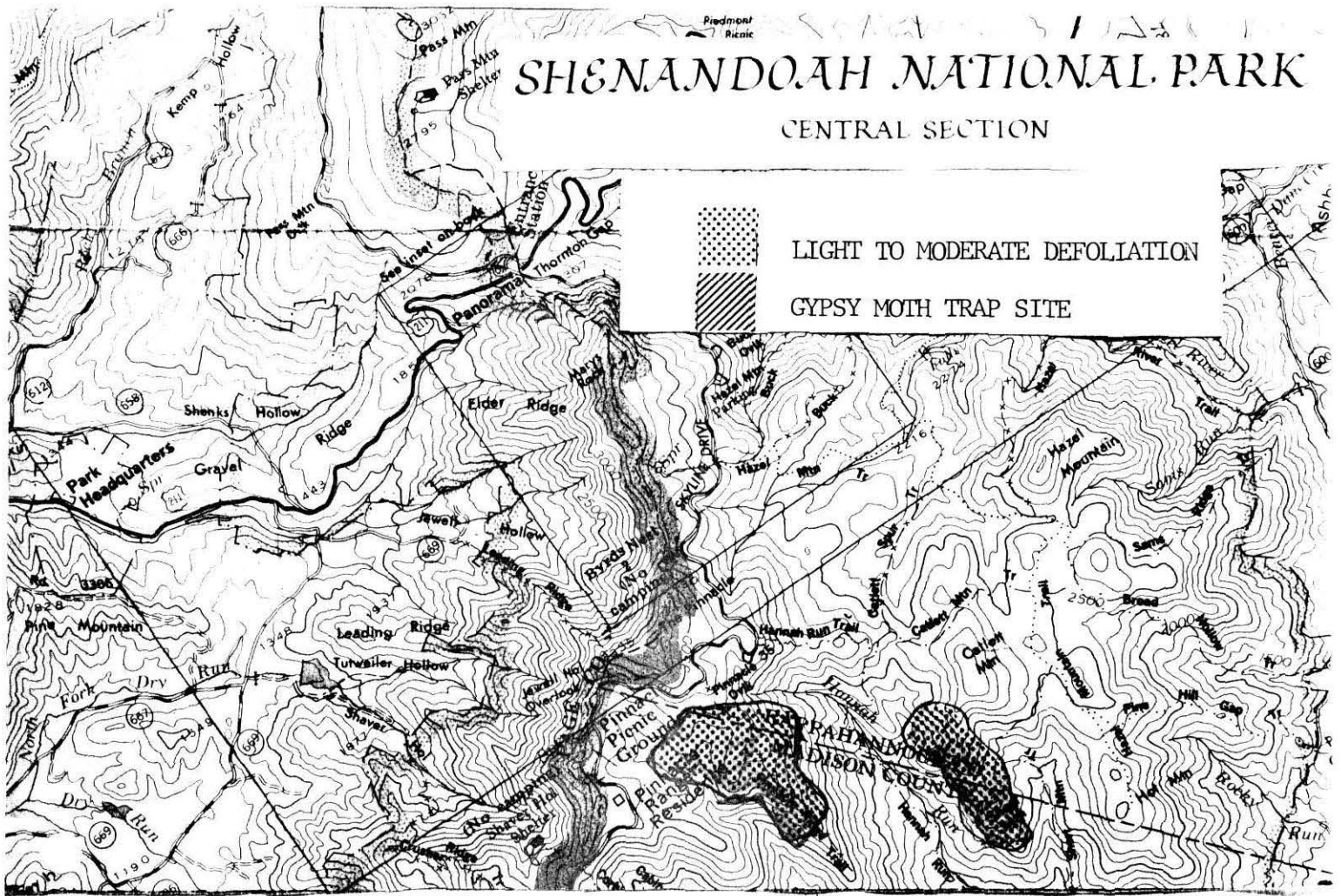


# SHENANDOAH NATIONAL PARK

## CENTRAL SECTION

LIGHT TO MODERATE DEFOLIATION

GYPSY MOTH TRAP SITE

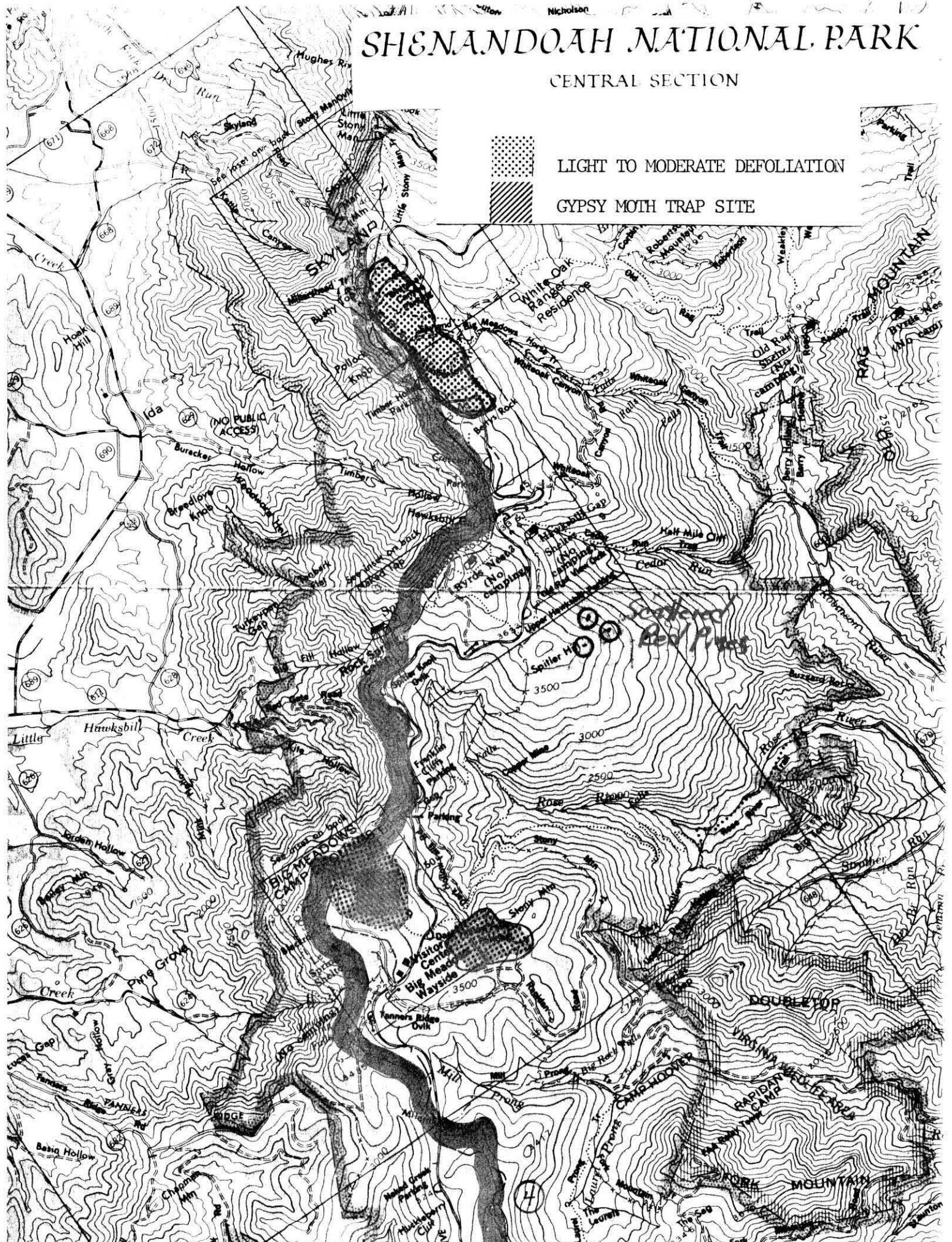


# SHENANDOAH NATIONAL PARK

## CENTRAL SECTION

LIGHT TO MODERATE DEFOLIATION

GYPSY MOTH TRAP SITE







# SHENANDOAH NATIONAL PARK CENTRAL SECTION

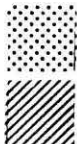


LIGHT TO MODERATE DEFOLIATION  
GYPSY MOTH TRAP SITE

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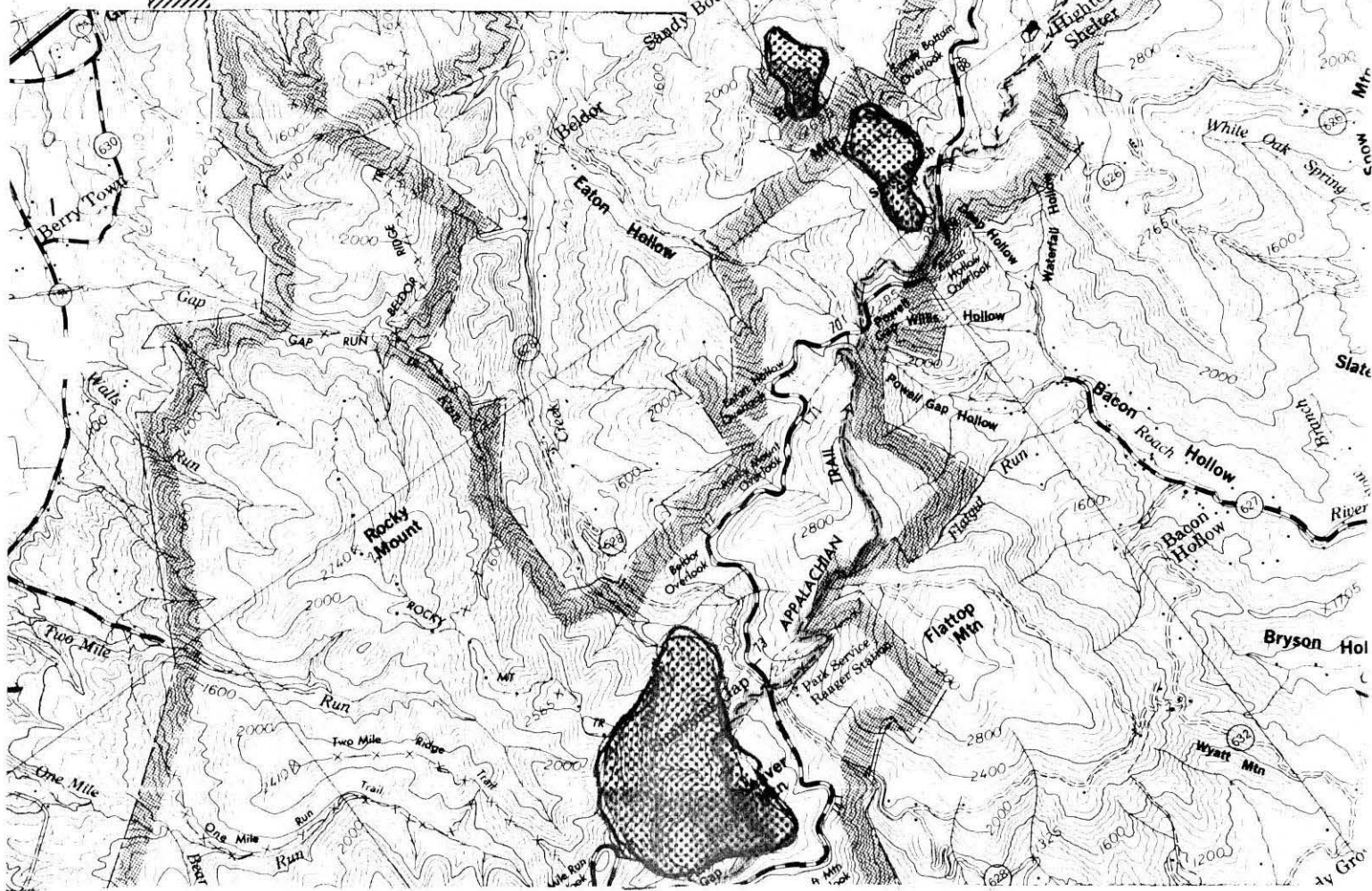


# SHENANDOAH NATIONAL PARK Southern Section



LIGHT TO MODERATE DEFOLIATION

GYPSY MOTH TRAP SITE



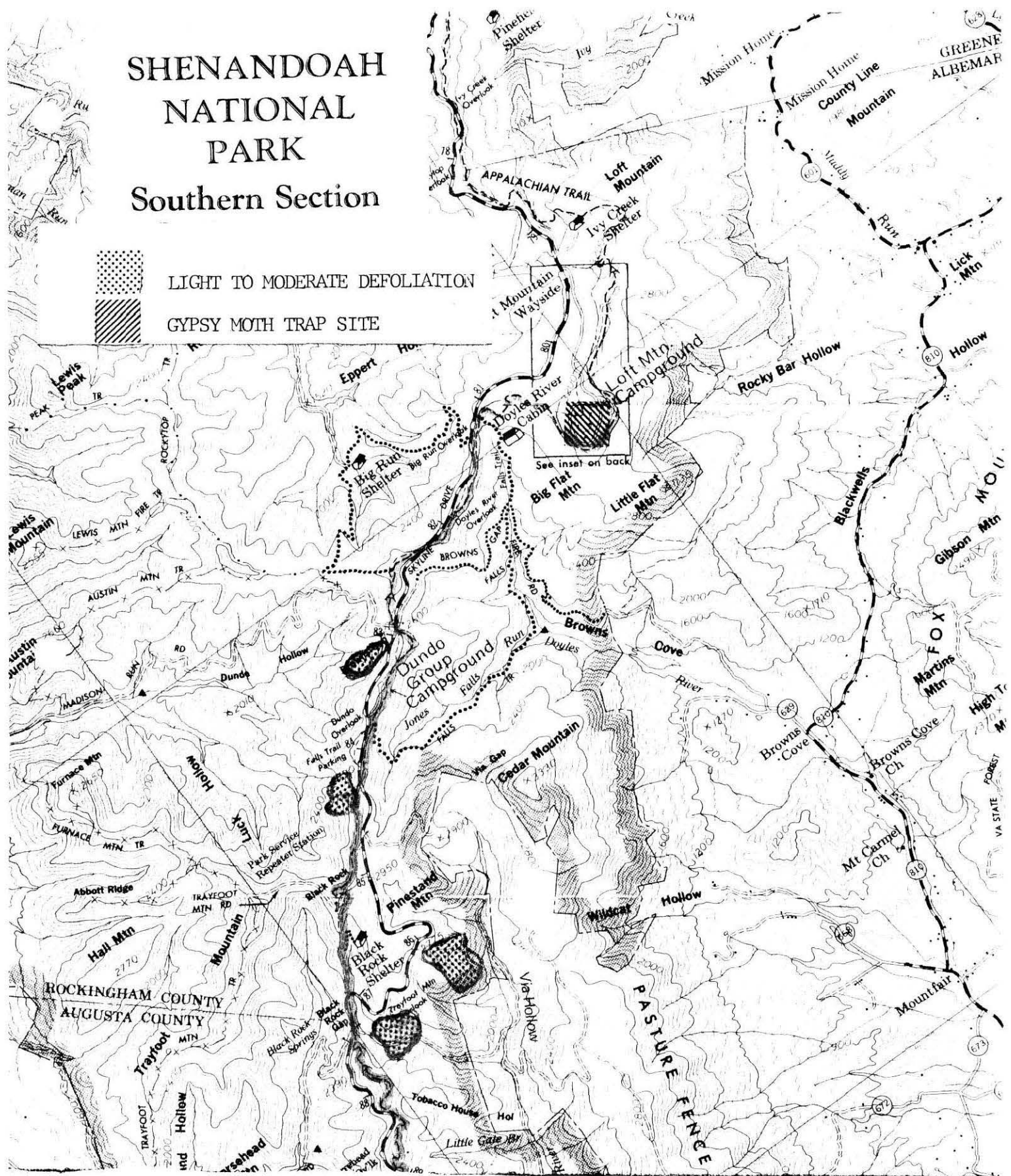


# SHENANDOAH NATIONAL PARK Southern Section



LIGHT TO MODERATE DEFOLIATION

GYPSY MOTH TRAP SITE



# SHENANDOAH NATIONAL PARK

## Southern Section

LIGHT TO MODERATE DEFOLIATION  
GYPSY MOTH TRAP SITE

